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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/651,589	08/29/2003	Vincent C. Moyer	10021040-1	9284
<div>57299 7590 10/05/2007</div> <div>Kathy Manke Avago Technologies Limited 4380 Ziegler Road Fort Collins, CO 80525</div>				
			<div>EXAMINER</div> <div>SHERMAN, STEPHEN G</div>	
			<div>ART UNIT</div> <div>2629</div>	<div>PAPER NUMBER</div>
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

avagoip@system.foundationip.com
kathy.manke@avagotech.com
scott.weitzel@avagotech.com

<p align="center">Office Action Summary</p>	Application No. 10/651,589		Applicant(s) MOYER, VINCENT C.	
	Examiner Stephen G. Sherman		Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5,7,10-12,14-18,20-22 and 24-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,7,10-12,14-18,20-22,24,26 and 28 is/are rejected.
- 7) ☒ Claim(s) 25,27 and 29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9 May 2007 has been entered. Claims 1-2, 4-5, 7, 10-12, 14-18, 20-22 and 24-29 are pending.

Response to Arguments

2. Applicant's arguments with respect to claims 1-2, 4-5, 7, 10-12, 14-18, 20-22, 24, 26 and 28 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2, 5, 11-12, 15, 17-18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobachi et al. (US 6,326,948) in view of Drake (US 7,046,229).

Regarding claim 1, Kobachi et al. disclose an input device comprising:

a captive disc (Fig. 1, item 1) movably suspended over a sensor (Fig.1, see col. 8, lines 6-7), said captive disc having an active surface (Fig. 1, item 3) facing said sensor;

wherein said sensor is adapted to take successive images of the active surface of said captive disc (see Fig. 7A and 7B, and see col. 9, lines 50-63, where the reflected light is imaged by the photodiodes PD1 to PD4, therefore it is taking successive images of the active surface);

a horizontal spring allowing resistive movement of said captive disc in horizontal directions (Fig. 1, item 2, or Fig. 27, spring 2).

Kobachi et al. fail to teach a single embodiment featuring a horizontal spring as discussed above, as well as a vertical spring allowing resistive movement of said captive disc in vertical direction.

However, Kobachi does teach an embodiment with a vertical spring allowing resistive movement of a captive disc in the vertical directions (see Fig. 35).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the vertical spring and the spacing created between the sensor and captive surface of Kobachi et al.'s embodiment on Fig. 35 into the first embodiment of Kobachi on Fig. 1, where the motivation to combine is to create a device

that allows movement in the X and Y direction in order to detect X-Y movements of a cursor control device, and also to allow movements in the vertical direction such that an additional type of input in the Z-direction can be sensed.

Kobachi et al. fail to explicitly teach of the active surface having a predetermined pattern, wherein the sensor is adapted to take successive images of the predetermined pattern of the active surface and compares the successive images of the predetermined pattern to determine the movement of said captive disc.

Drake discloses of an input device (Figure 8) comprising:

an active surface having a predetermined pattern (Figure 8 and column 11, lines 19-23),

a sensor (Figure 8 and column 11, lines 14-18);

wherein the sensor is adapted to take successive images of the predetermined pattern of the active surface and compares the successive images of the predetermined pattern to determine the movement of said captive disc (Column 11, lines 24-31).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to make the active surface have a predetermined pattern and to incorporate the sensor as taught by Drake in the movement determination device taught by Kobachi et al. in order to provide a more accurate detection method for determining the movement of the captive disc.

Regarding claim 2, Kobachi et al. and Drake disclose the device recited in claim

1.

Kobachi et al. further disclose a device further comprising a frame (Fig. 1, item 6) housing said captive disc; and said horizontal spring (Fig. 1, item 2, see col. 8, 19-20) adapted to center said captive disc within said frame (Fig. 1).

Regarding claim 5, Kobachi et al. and Drake disclose the device recited in claim 1.

Kobachi et al. further disclose a device wherein said active surface comprises a navigation area (Fig. 1, where the surface of item 3 is the navigation area) and a border area (the bottom surface of item 1) generally surrounding said navigation area (Fig. 1, it is inherent that the surface area portion of item 1 that surrounds item 3); and

said sensor distinguishes between different patterns of the navigation area and the border area and suppresses any movement determined from the border area (Since column 8, line 45-64 explain that the sensor only receives light reflected from the reflective plate 3, the sensor does not detect movement from the border region, and therefore the movement of the border area is suppressed.).

Regarding claim 11, Kobachi et al. and Drake disclose the device recited in claim 1.

Kobachi et al. further teaches a device further comprising a light source (Fig. 1, item LD) adapted to provide illumination on the active surface (col. 8, lines 26-28).

Regarding claim 12, Kobachi et al. disclose an input device comprising:

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a captive disc (Fig. 1, item 1) movably suspended over said sensor (Fig. 1, see col. 8, lines 6-7), said captive disc having an active surface (Fig. 1, item 3) facing said sensor;

wherein said sensor is adapted to take successive images of the active surface of said captive disc (see Fig. 7A and 7B, and see col. 9, lines 50-63, where the reflected light is imaged by the photodiodes PD1 to PD4, therefore it is taking successive images of the active surface);

an illuminant (Fig. 1, item LD) adapted to provide light toward the active surface (col. 8, lines 26-28);

a horizontal spring (Fig. 1, item 2) adapted to center said captive disc (Fig. 1);
and

a vertical spring allowing resistive movement of said captive disc in vertical direction (as discussed above in regards to claim 1).

Kobachi et al. fail to explicitly teach of the active surface having a predetermined pattern, wherein the sensor is adapted to take successive images of the predetermined pattern of the active surface and compares the successive images of the predetermined pattern to determine the movement of said captive disc.

Drake discloses of an input device (Figure 8) comprising:

an active surface having a predetermined pattern (Figure 8 and column 11, lines 19-23),

a sensor (Figure 8 and column 11, lines 14-18);

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wherein the sensor is adapted to take successive images of the predetermined pattern of the active surface and compares the successive images of the predetermined pattern to determine the movement of said captive disc (Column 11, lines 24-31).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to make the active surface have a predetermined pattern and to incorporate the sensor as taught by Drake in the movement determination device taught by Kobachi et al. in order to provide a more accurate detection method for determining the movement of the captive disc.

Regarding claim 15, this claim is rejected under the same rationale as claim 5.

Regarding claim 17, Kobachi et al. disclose an electronic apparatus comprising:
a screen (col. 1, line 7) displaying information including an icon (col. 1, line 7);
an input device for controlling the icon (col. 1, line 6), said input device
comprising:

a captive disc (Fig. 1, item 1) movably suspended over said sensor (Fig. 1), said captive disc having an active surface (Fig. 1, item 3) facing said sensor;

wherein said sensor is adapted to take successive images of the active surface of said captive disc (see Fig. 7A and 7B, and see col. 9, lines 50-63, where the reflected light is imaged by the photodiodes PD1 to PD4, therefore it is taking successive images of the active surface);

a horizontal spring allowing resistive movement of said captive disc in horizontal directions (Fig. 1, item 2, or Fig. 27, spring 2).

Kobachi et al. fail to teach a single embodiment featuring a horizontal spring as discussed above, as well as a vertical spring allowing resistive movement of said captive disc in vertical directions.

However, Kobachi does teach an embodiment with a vertical spring allowing resistive movement of a captive disc in the vertical directions (see Fig. 35).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the vertical spring and the spacing created between the sensor and captive surface of Kobachi et al.'s embodiment on Fig. 35 into the first embodiment of Kobachi on Fig. 1, where the motivation to combine is to create a device that allows movement in the X and Y direction in order to detect X-Y movements of a cursor control device, and also to allow movements in the vertical direction such that an additional type of input in the Z-direction can be sensed.

Kobachi et al. fail to explicitly teach of the active surface having a predetermined pattern, wherein the sensor is adapted to take successive images of the predetermined pattern of the active surface and compares the successive images of the predetermined pattern to determine the movement of said captive disc.

Drake discloses of an input device (Figure 8) comprising:

an active surface having a predetermined pattern (Figure 8 and column 11, lines 19-23),

a sensor (Figure 8 and column 11, lines 14-18);

wherein the sensor is adapted to take successive images of the predetermined pattern of the active surface and compares the successive images of the predetermined pattern to determine the movement of said captive disc (Column 11, lines 24-31).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to make the active surface have a predetermined pattern and to incorporate the sensor as taught by Drake in the movement determination device taught by Kobachi et al. in order to provide a more accurate detection method for determining the movement of the captive disc.

Regarding claim 18, Kobachi et al. and Drake disclose the device recited in claim 17.

Kobachi et al. further disclose an apparatus further comprising: frame housing (Fig. 1, item 6) said captive disc; and said horizontal spring (Fig. 1, item 2) adapted to center said captive disc within said frame (Fig. 1)

Regarding claim 21, this claim is rejected under the same rationale as claim 5.

5. Claims 7, 10, 16, 22, 24, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobachi et al. (US 6,326,948) in view of Drake (US 7,046,229) and further in view of Gordon et al. (US 6,057,540) and Bynum et al. (US 2006/0028442).

Regarding claims 24, 26 and 28, Kobachi et al. and Drake disclose the device recited in claims 1, 12 and 17.

Kobachi et al. also disclose wherein:

the horizontal spring returns said captive disk to a horizontal rest position said captive disk is released (Figure 27, items 2 are springs, which means that the device will return to its initial position when a user's finger is released);

the vertical spring returns said captive disc to a rest plane when said captive disk is released (Since a spring biases the input device, by the natural characteristics of a spring, the device will return to an initial position when a user's finger is released.);

said sensor determines the movement of said captive disk by taking the successive images of the active surface when said captive disc is proximal to a focal plane (see Fig. 7A and 7B, and see col. 9, lines 50-63, where the reflected light is imaged by the photodiodes PD1 to PD4, therefore it is taking successive images of the active surface, and column 9, lines 41-48 where it is inherent that the plane perpendicular to the optical axis that is mentioned here is the focal plane.).

Kobachi et al. and Drake fail to teach that the movement is determined when surface is proximal to a focal plane below a rest plane so that the active surface is in focus for said sensor.

Gordon et al. disclose that the movement is determined when surface is proximal to a focal plane below a rest plane so that the active surface is in focus for said sensor (Figure 1 shows that the focal point is below the surface 5 rest plane shown in the Figure.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the method of putting the focal plane below the active surface as taught by Gordon et al. in the input device taught by the combination of Kobachi et al. and Drake in order to prevent unintended displacement of the disc as being determined as movement.

Kobachi et al., Drake and Gordon et al. fail to teach where said sensor does not determine the movement of said captive disk when said captive disk is released from the focal plane so that the active surface becomes out of focus for said sensor

Bynum et al. disclose an input device where said sensor does not determine the movement of said captive disk when said captive disk is released from the focal plane so that the active surface becomes out of focus for said sensor (Figure 7 shows an active region 34 of the dome shaped input device, while Figure 19 shows where the dome is deflectable as explained in paragraph [0106], and Figure 3 shows a configuration showing where the focal plane is located. Based on these Figures and the description of paragraph [0106], the examiner understands that when the dome is in a position as shown in Figure 3 the movement can be detected, however, when the dome is moved out of focus, x and y movement will not be detected.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the method taught by Bynum et al. of the detection surface being out of focus with the input device taught by the combination of Kobachi et al., Drake and Gordon et al. in order to allow realize for the actuation of a switch in a z-axis direction as explained in paragraph [0106] of Bynum et al.

Regarding claims 7 and 22, Kobachi et al., Drake, Gordon et al. and Bynum et al. disclose the device recited in claims 24 and 28.

Gordon et al. also disclose a focusing lens adapted to focus light from a portion of the active surface to said sensor when the active surface is proximal to the focal plane (Figure 1, item 8 as described in column 4, lines 37-41).

Regarding claims 10 and 16, Kobachi et al., Drake, Gordon et al. and Bynum et al. disclose the device recited in claims 24 and 26.

Kobachi et al. further disclose a device further comprising a selection switch (Fig. 31, item 40) adapted to detect a user selection (see col. 17, lines 47-53, it is inherent that item 40 can be operated as a switch from the 2-dimensional plane to the 3-dimensional plane where a user makes a selection to move in the Z-direction by applying pressure to item 40).

Bynum et al. further disclose of a selection switch adapted to detect a user selection that moves said capacitive disk to a selection plane below the focal plane (Paragraph [0106]).

6. Claims 4, 14 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobachi et al. (US 6,326,948) in view of Drake (US 7,046,229) and further in view of Gordon et al. (US 6,057,540), Bynum et al. (US 2006/0028442) and Hoshino et al. (US 2006/0082549).

Regarding claims 4, 14 and 20, Kobachi et al., Drake, Gordon et al. and Bynum et al. disclose the device recited in claims 24, 26 and 28.

Kobachi et al., Drake, Gordon et al. and Bynum et al. fail to teach a device wherein the active surface has a convex shape so a border area is out of focus of said sensor when said capacitive disk is in the focal plane.

Hoshino et al. disclose a device wherein the active surface has a convex shape (Figure 19B). Therefore, based on the combination of references, the border area as explained in the previous rejections would be out of focus of said sensor since the focal plane would be located below the surface of the convex shaped input surface.

Therefore it would have been obvious to “one of ordinary skill” in the art at the time the invention was made to made the input device taught by the combination of Kobachi et al., Drake, Gordon et al. and Bynum et al. in a convex shape as taught by Hoshino et al. in order to prevent input misinterpretation of the device when, for example, the device is located within a cell phone and the cell phone is within a user’s pocket (See Figure 19A of Hoshino et al. and the bottom of paragraph [0139].).

Allowable Subject Matter

7. Claims 25, 27 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 25, 27 and 29, the primary reason for indicating allowable subject matter is the inclusion of the limitation of said active surface comprising “a navigation area having a first pattern and a border area having a second pattern generally surrounding said navigation area, and the pattern of the border area has a lower density than the pattern of the navigation area so the border area becomes out of focus for the sensor faster than the navigation area when said captive disc moves from the focal plane to the rest plane”, which is not found singularly or in combination within the prior art.

The closest prior art references (Kobachi et al. (US 6,326,948), Drake (US 7,046,229), Gordon et al. (US 6,057,540), Bynum et al. (US 2006/0028442) and Hoshino et al. (US 2006/0082549)) disclose of the navigation area with a predetermined pattern, but fail to teach of the border area having a pattern that has a lower density so that it becomes out of focus faster than the navigation area.

Conclusion

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen G. Sherman whose telephone number is (571) 272-2941. The examiner can normally be reached on M-F, 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SS

27 September 2007

AMR A. AWAD
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to read "Amr A. Awad", with a long, sweeping horizontal stroke extending to the right.